

Response of guinea grass (*Panicum maximum* Jacq) to application of cow dung in South West Nigeria

O.S. Onifade, J.A. Olanite, A.O. Jolaosho, M.O. Arigbede and N.K. Tijani

Dept. of Pasture and Range Management, College of Animal Science and Livestock Production, University of Agriculture, Abeokuta, Ogun State, Nigeria, E-mail: femionifade@yahoo.com

Keywords: Guinea grass, cow dung, forage yield, crude protein content

Introduction The yield of forage species from the world's grazing land is limited by poor soil and unproductive species (Jones & Wild, 1975; Cooke, 1982). The use of manure on pasture land not only represents a low cost disposal method but also a means of recycling nutrients for plant growth and counteracting the decreasing organic matter content in most agricultural soils. In agro-pastoral production systems, the interaction between crops and livestock is important. Manures are used mainly to complement inorganic fertiliser in the production of food crops. There is a dearth of information on the response of pasture grass to application of cow dung and so the response of two *Panicum maximum* ecotypes to cow dung was evaluated.

Materials and methods The experiment was carried out at the Teaching and Research Farm of the University of Agriculture, Abeokuta, Nigeria. There were four treatments consisting of two ecotypes of *Panicum maximum* – Ntchisi and local. These received either 30 kg N/ha as cow dung or no dung (control). A randomised complete block design was used with three replicates. Crown splits (about 20 cm in length) of the two grasses were transplanted 50 cm between and within rows into a cultivated seedbed in May, 2002. Cow dung was broadcast one week after transplanting (WAP). The heights (to the tip of the youngest leaf) and dry matter (DM) yields were estimated every four weeks. Crude protein was determined according to the methods of AOAC (1990).

Results The height of the local ecotype of *Panicum maximum* (119 cm) was consistently higher ($P \leq 0.05$) than the improved Ntchisi ecotype (99 cm). The mean heights of both ecotypes at 4, 8, 12, 16 and 20 WAP were 47, 81, 137, 155 and 152 cm, respectively. The values from week 12 to 20 were similar ($P = 0.05$). The differences in height between Ntchisi + Cow dung (109 cm) and Local – Cow dung (102 cm) were not significant. The greatest height (136.5cm) was for Local + cow dung and the least (88.2cm) for Ntchisi – cow dung. There was no stem component when measured four weeks after planting (Table 1). Application of cow dung to Ntchisi enhanced the leaf and stem DM yields, except in week 8 for the leaf component. Total DM yields at 8, 16 and 12 weeks were 430, 750 and 810% higher than the initial cut, respectively. Throughout the growing season, the two control treatments had the lowest total DM yields. The leaf, stem and total DM yields reached maximum values at week 12 but were similar to those at week 16. The CP contents for the stem components ranged from 9.2 to 12.1% and 7.3 to 10.3% at weeks 8 and 12 respectively. The controls had lower CP contents compared to the treatments which received cow dung.

Table 1 Effects of cow dung application on dry matter yields (t/ha) of two ecotypes of *P. maximum*

Treat.	4WAP		8WAP			12WAP			16WAP		
	Leaf	Total	Stem	Leaf	Total	Stem	Leaf	Total	Stem	Leaf	Total
N + CD	0.43	0.43	1.11	0.74	1.85	2.44	1.07	3.51	2.22	1.05	3.27
L + CD	0.35	0.35	0.48	0.99	1.47	1.64	0.87	2.51	1.54	0.79	2.33
N - CD	0.21	0.21	0.82	0.44	1.26	1.07	0.76	1.83	1.03	0.56	1.59
L - CD	0.81	0.81	0.22	0.95	1.17	0.83	0.64	1.47	0.95	0.53	1.48
Mean	0.29	0.29	0.66	0.78	1.44	1.49	0.84	2.33	1.44	0.73	2.17
SEM	0.05	0.05	0.13	0.07	0.11	0.25	0.06	0.30	0.02	0.07	0.27

WAP = Weeks after transplanting, N = Ntchisi, L = Local, CD = Cow dung

Conclusion Application of cow dung increased growth, DM production and CP content of *Panicum maximum* (Ntchisi) compared to the local ecotype over a period of twenty weeks.

References

- AOAC (1990). Association of Official Agricultural Chemists, Official Methods of Analysis Washington DC.
 Cooke, G.W. (1982). Fertilizing for Maximum Yield. 2nd ed. Grenada Publishing Coy, London.
 Hodges, R.D. (1991). Soil organic matter: Its central position in organic farming. In: Wilson, W.S. (ed.)
 Advances in Soils Organic Research: The impact on Agriculture and the Environment. The Royal Society of
 Chemistry, Redwood Press, Wiltshire, U.K.
 Jones, M.J. & A. Wild (1975). Soils of the West African Savanna. CAB Technical Communication No. 55,
 Harpenden, UK.